

3D Flash LIDAR Real-Time Embedded Processing, Phase II

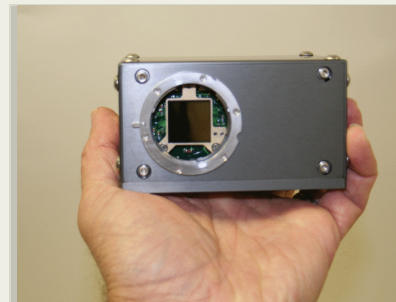
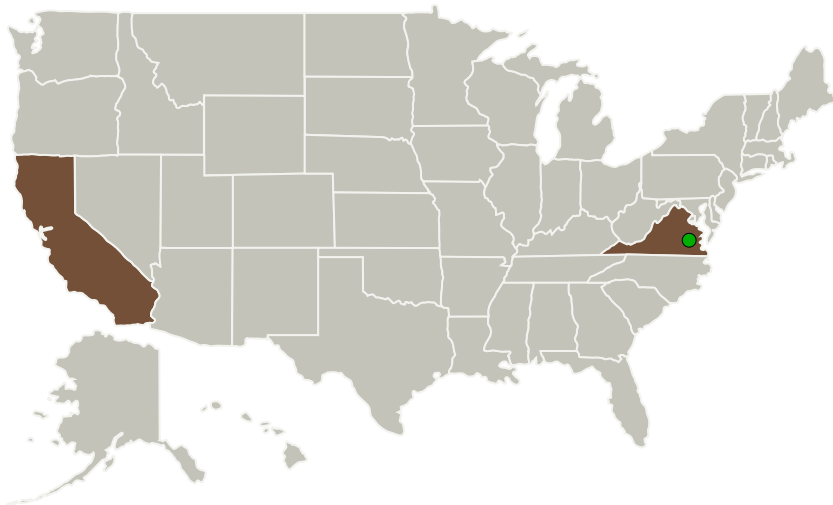
Completed Technology Project (2012 - 2014)



Project Introduction

3D Flash LIDAR (3DFL) is ideal for determining real-time spacecraft trajectory, speed and orientation to the planet surface, as well as evaluating potential hazards at the landing. The "framing camera" nature of 3DFL systems makes them well suited as hazard avoidance and docking sensors for EDL and AR&D. 3DFL can provide a direct, real-time measurement of the altitude of the spacecraft during descent as well as surface relative velocity and orientation, while simultaneously mapping terrain topography to identify landing hazards and provide localization information. ASC has developed the core technology for Flash LIDAR with its 3D-FPA hybrid, but would like to work with NASA to further enhance the functionality of the 3D sensor by adding embedded image enhancement and classification algorithms. For this SBIR solicitation, ASC is developing a new 3D Flash LIDAR camera architecture that allows for embedded processing of 3D Flash LIDAR point clouds. Advanced Scientific Concepts Inc. (ASC) is a small business that has developed a number of 3D flash LADAR systems and has twice successfully flown 3DFL cameras (DragonEyes) on space shuttle (STS 127 and 133) Rendezvous and Docking DTO missions with the ISS; the first 3DFL in space.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Advanced Scientific Concepts, Inc.	Lead Organization	Industry	Goleta, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Transitions

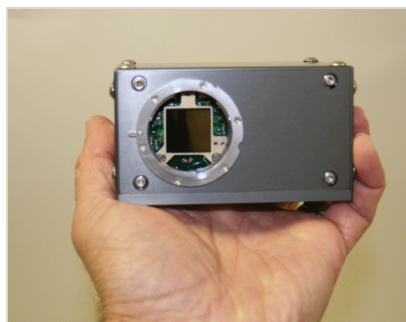
▶ **April 2012:** Project Start

✓ **April 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137798>)

Images

**Project Image**

3D Flash LIDAR Real-Time Embedded Processing
(<https://techport.nasa.gov/image/128263>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Scientific Concepts, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

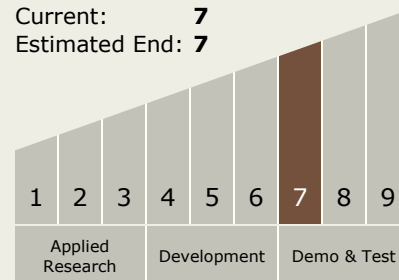
Carlos Torrez

Principal Investigator:

Steve Penniman

Technology Maturity (TRL)

Start: 7
Current: 7
Estimated End: 7



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Technology Areas

Primary:

- TX02 Flight Computing and Avionics
 - └ TX02.1 Avionics Component Technologies
 - └ TX02.1.6 Radiation Hardened ASIC Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System